

Transit Bus Fleet Rule and Emission Standards for New Urban Buses



April 26, 2001

California Environmental Protection Agency



Air Resources Board

Today's Presentation

- In-Use Fleet Requirements
 - Alternative NOx Strategy
 - NOx Fleet Average
 - PM Retrofit
 - Low Sulfur Diesel Fuel
- Zero-Emission Bus (ZEB) Requirements
- Reporting Requirements

Adopted Urban Transit Bus Fleet Rule Requirements and Emission Standards				
Model Year	"Diesel" Path		"Alternative-Fuel" Path	
	NOx (g/bhp-hr)	PM (g/bhp-hr)	NOx (g/bhp-hr)	PM (g/bhp-hr)
2000	4.0	0.05	2.5 optional ⁽¹⁾	0.05
10/2002	2.5 NOx+NMHC	0.01	1.8 NOx+NMHC optional ⁽¹⁾	0.03
10/2002	4.8 NOx fleet average		4.8 NOx fleet average	
2003-09	Accelerated PM Retrofit Requirements ⁽²⁾ ≤ 15 ppm sulfur diesel fuel		PM Retrofit Requirements ≤ 15 ppm sulfur diesel fuel	
7/2003	3 bus demo of ZEBs for large fleets (>200)			
2004 ⁽³⁾	0.5	0.01		
2007	0.2	0.01	0.2	0.01
2008	15% of new purchases are ZEBs for large fleets (>200)			
2010			15% of new purchases are ZEBs for large fleets (>200)	

Notes: Shaded area shows existing requirements and existing optional emission standards.

- (1) Although transit agencies on the alternative-fuel path are not required to purchase engines certified to these optional standards, the staff expects that they will do so in order to qualify for incentive funding. At present, the only alternative-fuel engines available are certified to optional, lower-emission NOx standards.
- (2) Transit agencies on the diesel path must meet the PM retrofit requirements at an accelerated rate and must complete all retrofits by 2007.
- (3) In lieu of purchasing buses meeting the 2004 – 2006 emission standards, transit agencies may implement an alternative strategy that achieves greater NOx emission reductions. The alternative strategy must be approved by the ARB's Executive Officer.

Alternative NOx Strategy

- “The Executive Officer may exempt transit agencies on the diesel path from the requirements” of 1956.2 (d)(4) provided that:
 - (1) The Transit Agency applies to the EO by June 30, 2001.

Alternative NOx Strategy

- (2) The Transit Agency demonstrates that it will achieve **greater** NOx reductions than would have been achieved through compliance with the (d)(4) standards; and
- (3) The EO must find that transit agencies have demonstrated, or are contractually committed to demonstrate, advanced NOx aftertreatment technology.

In-Use Fleet Requirements NOx Fleet Average

- NOx Fleet Average
 - Applies to all transit agencies
 - 4.8 g/bhp-hr NOx
 - October 1, 2002
- Compliance Options
 - Based on all buses in the active fleet
 - Apply by 1/31/02 to include ZEBs that are not “urban buses” in calculation

In-Use Fleet Requirements PM Retrofit

- Retrofit Using ARB-Certified Devices
- Phased-In Schedule By
 - Fuel Path
 - Model Year
- Delayed Implementation for Small Transit Agencies in Federal One-Hour Ozone Attainment Areas

PM Retrofit Schedule Diesel Path

Tiers	2003	2004	2005	2006	2007
Tier 1 Pre-1991	100 %				
Tier 2 1991 - 1995	50 %	100 %			
Tier 3 1996 - 2002			20 %	75 %	100 %

Note: Percentages of retrofit requirements must be met by January 1 of each year.

PM Retrofit Schedule Alternative Fuel Path

Tiers	2003	2004	2005	2006	2007	2008	2009
Tier 1 Pre-1991	100 %						
Tier 2 1991 - 1995	20 %	75 %	100 %				
Tier 3 1996 - 2002					20 %	75 %	100 %

Note: Percentages of retrofit requirements should be met by January 1 of every year.

In-Use Fleet Requirements PM Retrofit (cont.)

- Exemptions
 - Pre-1991 Buses Already Retrofitted to 0.10 g/bhp-hr
 - Alternative Fuel Path
 - Buses within two years of retirement
 - Tier 2 and Tier 3
 - Diesel Path
 - Buses within one year of retirement
 - Tier 2 only

In-Use Fleet Requirements PM Retrofit (cont.)

- A Certified Retrofit Device Must be Available 6 Months Prior to Implementation Dates
- Currently, There Are No ARB-Certified Retrofit Devices
- Applications have been received

In-Use Fleet Requirements PM Retrofit-Demonstrations

- New York City Transit
 - Retrofitting entire fleet by 12/2003
 - 480 buses so far, up to 40,000 miles
 - No problems
 - Using two different trap manufacturers
- Los Angeles MTA
 - Currently 4 buses with traps
 - Plans for 10 additional installations

In-Use Requirements Low-Sulfur Diesel Fuel

- Low-sulfur diesel fuel
 - <15 parts per million (ppm) sulfur
 - July 1, 2002
- Delayed implementation for small transit agencies (<20 buses) in ozone attainment areas

ZERO-EMISSION BUS REQUIREMENTS



Zero-Emission Bus Demonstration

- EO Certified Urban Bus includes:
Hydrogen-Fuel Cell, Electric Trolley,
Battery-Electric
- Demonstration Required: Diesel Path
with >200 Buses
- Prepare and Solicit Bids by 1/1/02
- Place in Service by 1/1/03
- May Petition for a Joint Demo

Zero-Emission Bus Purchases

- Demonstration Report due 1/31/2005
- ARB Feasibility Review January 2006
- Diesel Path: 15% Purchase/Lease for
MY 2008-2015
- Alt. Fuel Path: 15% Purchase/Lease for
MY 2010-2015
- Credits for Early Purchase

Reporting Requirements For All Transit Agencies

- See handout for details
- ARB will continue to develop forms and post on website

ARB Staff Report to Board

- September 2001 Board Hearing
 - ▶ General Implementation Progress
 - ▶ Alternative NOx Strategy
 - ▶ Advanced Aftertreatment Technology
 - ▶ Update on Hybrid-Electric Test Procedure

ARB Website :

arb.ca.gov/msprog/bus/bus.htm

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